

b) one $-\text{CH}_2\text{CH}_2-$ group may be replaced by $-\text{CH}=\text{CH}-$
and one or more H of the $-\text{CH}_2-$ groups may be replaced by F
with the provisos that

- 1) n is 2, 3 or 4
- 5 2) two adjacent $-\text{CH}_2-$ groups cannot be replaced by $-\text{O}-$

a, b, c are each zero, 1 or 2, with the provisos that

- 1) a must be 1 when R^1 is hydrogen, F or CN
- 2) the sum of $a+b+c$ is at least 1
- 10 3) the radicals A and M, respectively, in the brackets may be identical or different when the corresponding index is 2.

Here and hereinbelow, it will be understood that bivalent radicals were designated in the "free state". This designation is essential for the
15 characterization of the compounds, although strictly in accordance with IUPAC rules, other designations of the bivalent radicals forming part of the entire Markush formula - meaning incorporation both as image and as mirror image - would be possible.

20 According to one embodiment, R^1 and R^2 are no alkenyl or alkenyloxy radicals.

The active-matrix display is preferably a monostable ferroelectric active-matrix display containing a liquid-crystal layer in the form of a monodomain
25 having an unambiguously defined direction of the layer normal z of the SmC phase, where the layer normal z and the preferential direction n in the nematic or cholesteric phase (N^* phase) form an angle of more than 5° and the liquid-crystal layer is composed of a ferroelectric (chiral smectic) liquid-crystal mixture comprising at least one compound of the formula (I).

30 The spontaneous polarization of the liquid-crystal mixture is preferably $< 200 \text{ nC/cm}^2$, particularly preferably $< 25 \text{ nC/cm}^2$, especially $< 15 \text{ nC/cm}^2$, the value DT (15,1), which is defined below, being > 20 .

35 The processes for producing the materials which are suitable for the mixtures of the invention are known in principle, as is the production of liquid-crystal mixtures from the individual components.

For example, the following materials have been described:

- thiadiazole derivatives: EP-A-0 309 514; EP-A-0 335 348; US 5,076,961; US 5,200,109
- thiazole derivatives: EP-A-0 309 514; EP-A-0 439 170
- pyrimidine derivatives: EP-A-0 220 296; 220 297; 227 717; 224 579;
- 5 293 910; US 4,891,151; EP-B 0 308 794; US 5,200,521; US 5,370,823; DE-A 43 00 435
- 4-fluoropyrimidine derivatives: US 5,344,585; EP-A-0 158 137
- pyridine derivatives: WO 86/06401; EP-A-0 206 228; EP-A-0 239 403; US 4,795,587; JP-A 07309858; JP-A 62207257; JP-A 05331143;
- 10 JP-A 05213875; JP-A 04356464; JP-A 01031765; JP-A 08062560; DE-A 40 26 233
- fluorinated pyridine derivatives: JP-B 2079059; US 5,389,291; US 5,630,962; US 5,445,763; DE-A 44 27 199; US 5,445,763
- 2-fluoropyrazine derivatives: US 5,562,859
- 15 1,2,3,4-tetrahydroquinazoline derivatives: US 4,402,849; JP-A 08062559; JP-A 08059629; JP-A 07207267
- quinoline derivatives: DE-A 195 38 404
- dioxane derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II), pp. 349-352; DD 249 277; DD 249 278; DD 249 279
- 20 isoxazole derivatives: Mol. Cryst. Liq. Cryst. 1993, 225, 175-182
- pyrane derivatives: JP-A 10168076; JP-A 10176168
- naphthalene derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II) pp. 313-322; DE-A 195 17 056; DE-A 195 17 038; DE-A 195 70 60; DE-A 195 22 167; DE-A 196 52 247; WO 92/16500;
- 25 EP-A-0 302 875
- indane derivatives: EP-A-0 546 338
- fluorophenyl derivatives: EP-A-0 210 215; GB-A 2,198,743
- difluorophenyl derivatives: EP-A-0 210 215; EP-A-0 332 024, 332 025
- trifluorophenyl derivatives: EP-A-0 602 596
- 30 tetrafluorophenyl derivatives: EP-A-0 110 002; EP-A-0 113 293; EP-A-0 422 996; JP 58188840; JP 59010553; JP 02180869; Mol. Cryst. Liq. Cryst. 127, 413 (1985)
- biphenyl and terphenyl derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II) pp. 269-304; EP-A-0 213 841; EP-A-0 263 843;
- 35 GB-B 2,198,743; GB-B 2,200,912; EP-B-0 395 666; EP-B-0 332 006; EP-A-0 360 042
- bicyclo[2.2.2]octane derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II) pp. 85-95

- cyclohexane derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II) pp. 32-72; Landolt-Börnstein Vol. IV/7a, pp. 160-176;
DE-A 23 44 732; 24 50 088; 24 29 093; 26 36 684; 27 01 591; 27 52 975;
DE-A-32 31 707; EP-A 0 233 267; EP-A 0 238 576
- 5 cyclohexene derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II) pp. 79 - 82; US 5,271,864; DE-A 39 30 119
1-alkylsilacyclohexane derivatives: EP-A-0 761 674; 742 222; 732 335;
727 428
meta-substituted mesogens: US 5,447,656
- 10 thiophene derivatives: Flüssige Kristalle in Tabellen II (liquid crystals in tables II) pp. 353-356; EP-A-0 458 347; EP-A-0 364 923; EP-A-0 392 510;
EP-A-0 459 406
benzothiazole derivatives: JP-A 09059266
phenanthrene derivatives: US 5,648,021; EP-B 0 743 971; DE-A 195 24 230;
- 15 DE-A 197 48 819; DE-A 196 53 010; DE-A 196 53 009; DE-A 196 53 008
fluorene derivatives: Landolt-Börnstein Vol. IV / 7a, pp. 36-41;
DE-A 197 20 289
ethyne derivatives: US 5,626,792; 5,178,791; 5,457,235; JP 10195025;
WO 98 23637; JP 10130188; JP 10120600; EP-A-0 799 878
- 20 ethane derivatives: WO 98 23583; WO 98 23563; JP 10147544;
JP 09235550; JP 0914660; JP 09087210; JP 06056703; DE-A 42 38 377;
JP 06025030; DE-A 32 01 721
and compounds containing the structural elements
silylalkyl: EP-B-0 366 561
- 25 cyclopropylalkyl: EP-B-0 318 423 / 398 155
perfluoroalkyl: Ferroelectrics 1988, 85, 375-384 or US 4,886,619,
5,082,587, 5,254,747, 5,262,082, 5,437,812 or 5,482,650
perfluorocyclohexyl: DE-A 197 48 818
 α -fluorocarbonyloxy: Liquid Crystals 1997, vol. 23, no. 5, pp. 659-666
- 30 2,3-difluoroalkyloxy: US 5,051,506
2-fluoroalkyloxy: US 4,798,680
 α -chlorocarbonyloxy: US 4,855,429
methyl-branched alkyl chains: EP-B-0 201 578, 211 030; DE-A 196 27 899
containing only one pendant group: EP-A-0 541 081; EP-A-0 606 090
- 35 propionyloxy: DD 284 894; EP-A-0 552 658; GB-B 2,235,192
tetrahydrofuranoyloxy: EP-A-0 355 561
cyanoalkyl: EP-A-0 310 620; EP-A-0 333 760; WO 89/05792
containing an oxirane group: EP-B-0 263 437; EP-B-0 292 954;
EP-B-0 365 820; DE-A 4133710; JP-B 2089393; JP-B 3-512741